

Abstract

The present invention is a method of deriving a reflectance function that analytically approximates the light reflected from an object model in terms of the spherical harmonic components of light. The reflectance function depends upon the intensity of light incident at each point on the model, but excludes light originating from below a local horizon, therefore not contributing to the reflectance because of the cast shadows. This reflectance function is used in the process of machine vision, by allowing a machine to optimize the reflectance function and arrive at an optimal rendered image of the object model, relative to an input image. Therefore, the recognition of an image produced under variable lighting conditions is more robust. The reflectance function of the present invention also has applicability in other fields, such as computer graphics.